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Matsumoto

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(54) **TIME STAMP**

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G01D 15/04 (2006.01)
B41J 3/36 (2006.01)

(52) **U.S. Cl.** **346/80**; 347/109

(58) **Field of Classification Search** 346/80, 346/141, 142; 347/109
See application file for complete search history.

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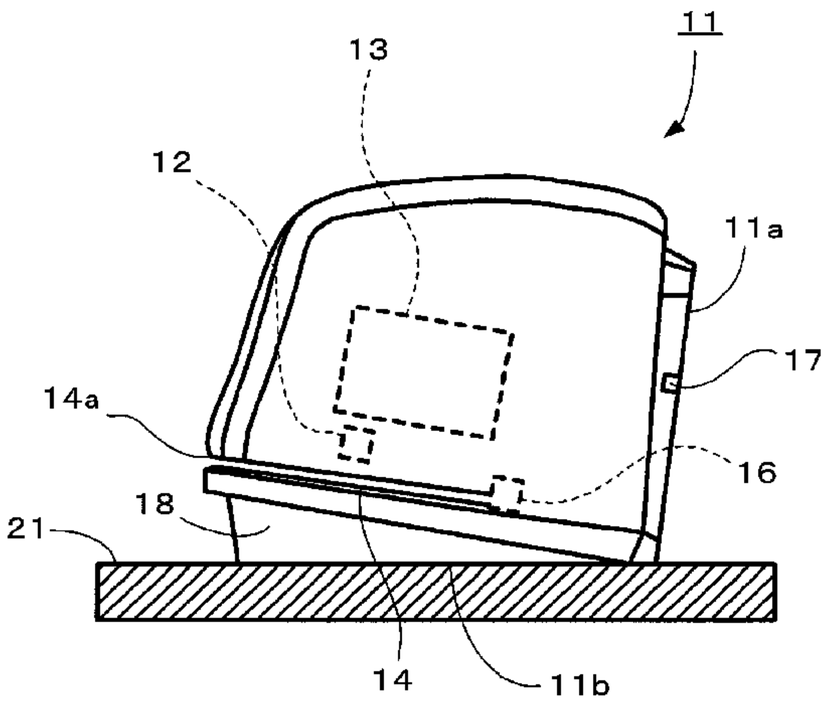
(57) **ABSTRACT**

A time stamp is a device that prints time information on a time card inserted into a time card slot. The time card slot is formed to be inclined downwardly in the depthwise direction of the time stamp at an angle of 8 to 10 degrees or so with the mount surface of the time stamp being a reference. The time stamp has a mount portion to be attached to a wall surface. The time card slot extends in a direction orthogonal to the rear surface of the time stamp.

1 Claim, 4 Drawing Sheets



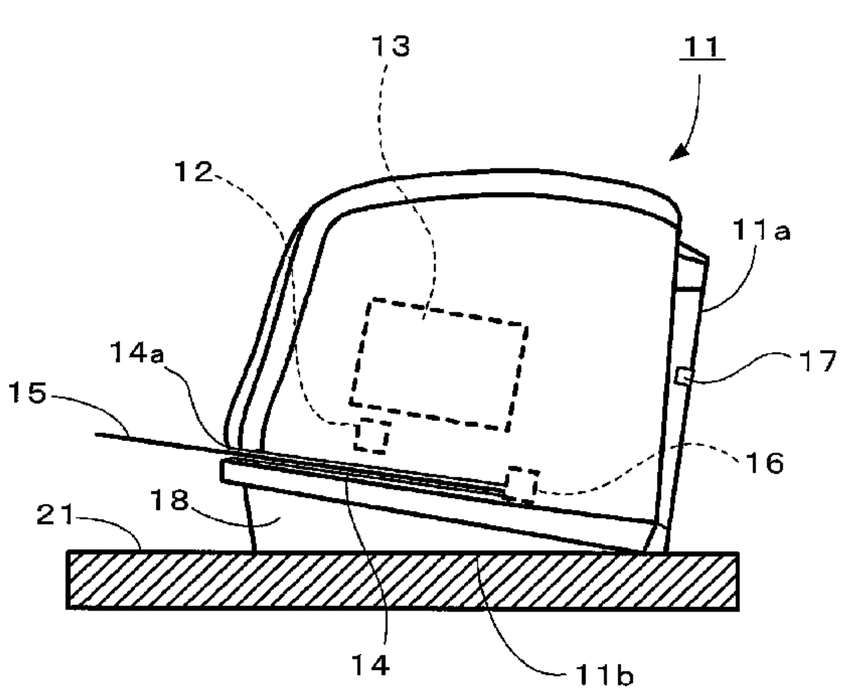


FIG.1

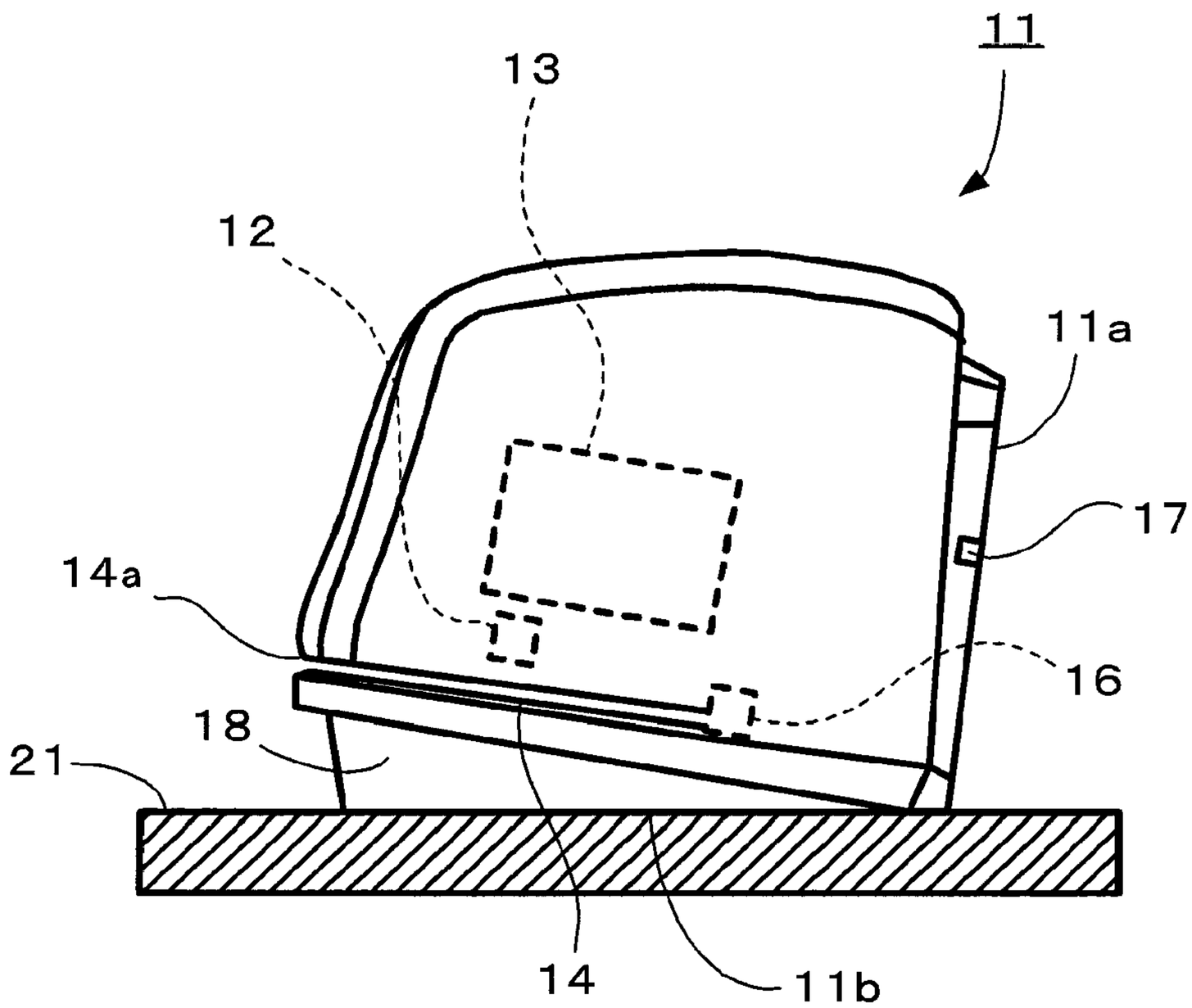
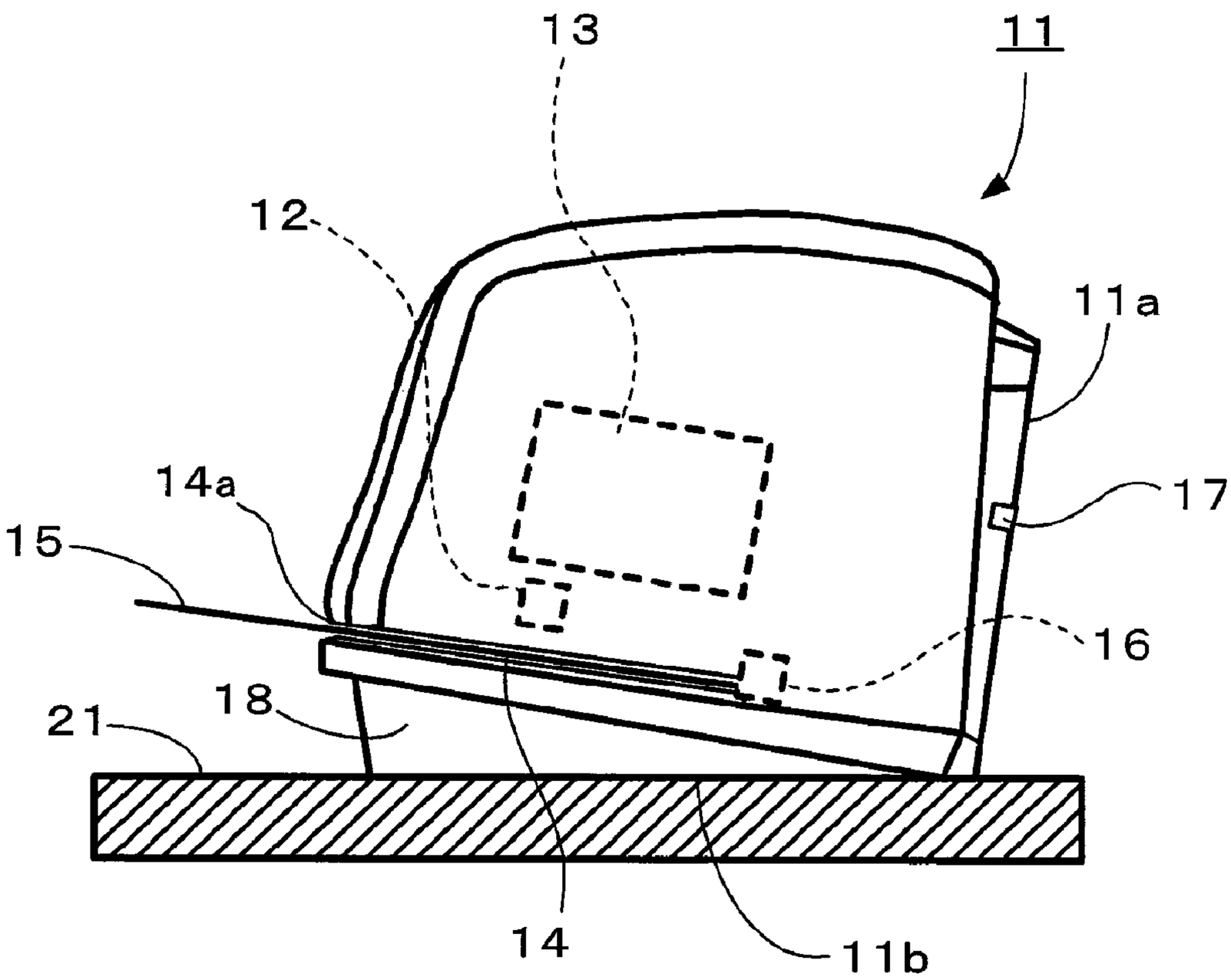


FIG.2



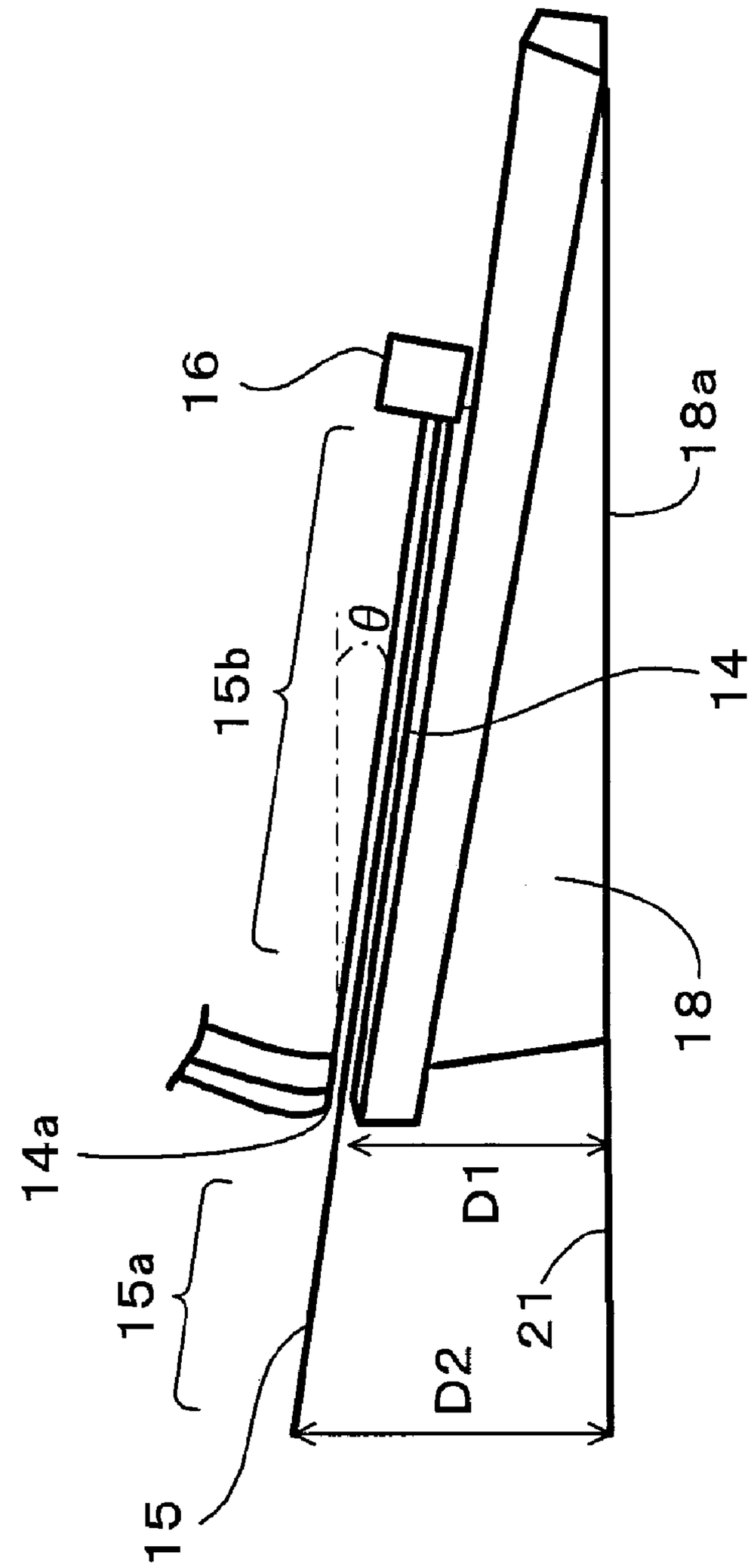
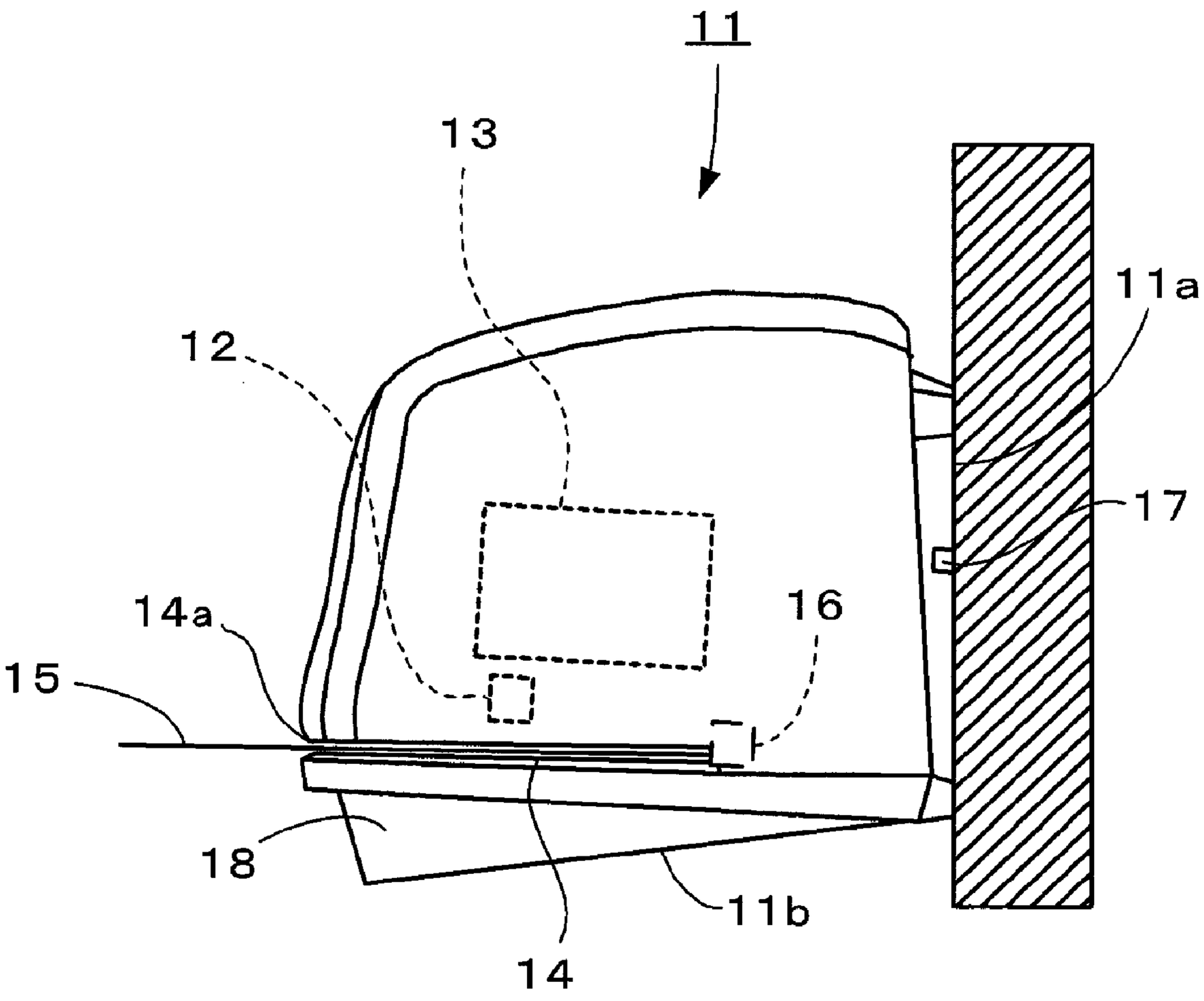


FIG.3

FIG.4



TIME STAMP

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a time stamp.

2. Description of the Related Art

Unexamined Japanese Utility Model Application KOKAI Publication No. H5-4284 discloses a time stamp having a time card slot provided at the top surface thereof as an example of a time stamp in which a time card is inserted from above.

Unexamined Japanese Patent Application KOKAI Publication No. H9-62883 discloses a time stamp having a time card slot provided at a side surface thereof. This type of time stamp generally has a print head or a print head carriage mechanism disposed at the upper portion there, and a time card slot provided under the print head or the print head carriage mechanism.

Because the time stamp disclosed in Unexamined Japanese Utility Model Application KOKAI Publication No. H5-4284 is configured so that a time card is inserted from above, it is difficult to insert the time card in the time stamp if placed at a high location. This limits the installation location.

The time stamp disclosed in Unexamined Japanese Patent Application KOKAI Publication No. H9-62883 has the time card slot provided under the print head or the print head carriage mechanism, so that if the time stamp is made short, the position of the time card slot becomes low. This makes it difficult for a user to recognize the presence of the time card slot. In addition, the distance between the mount surface of the time stamp and the time card slot becomes smaller, so that fingers holding a time card may contact the mount surface of the time stamp, making the insertion of the time card difficult. To avoid the difficulty, the position of the time card slot may be moved upward. If the position of the print head and the position of the print head carriage mechanism are moved upward accordingly, the time stamp cannot be made compact. Further, when the time card slot is located under the print head or the print head carriage mechanism, information such as a time is printed on a bottom surface of the time card. To check the contents printed on the time card, therefore, the user needs to flip over the time card after pulling it out of the time stamp. This reduces the operability.

SUMMARY OF THE INVENTION

In view of the above situation, it is an object of the present invention to provide a time stamp which facilitates insertion of a time card, and can be made compact.

To overcome the foregoing problems, according to the invention, there is provided a time stamp for printing time information on a time card inserted into a time card slot, wherein the time card slot is formed to be inclined downwardly in a depthwise direction with a mount surface of the time stamp being a reference.

According to the invention, because the time card slot is formed to be inclined downwardly in the depthwise direction with the mount surface of the time stamp being a reference, it is easy to recognize the insertion opening of the time card slot. Because the time card slot is formed to be inclined downward in the depthwise direction, a time card, when inserted into the slot, is inserted so as to be inclined depthwise. That is, the time card is inclined in such a way that its end portion located on the insertion opening side of the time card slot is positioned above the end portion located on the depthwise side of the time card slot. The mount surface of the time stamp is therefore separated from fingers holding the time card by the angle of the inclination, thus making it easier to insert the time card. At the time of inserting a time card into the time card slot, especially, the insertion opening side end portion of the time card is separate from the mount surface, so that a sufficient clearance can be secured between the fingers and the mount surface, thus making it easier to insert the time card.

According to the invention, because the time card slot is formed to be inclined downwardly in the depthwise direction, a print head and a print head carriage mechanism can be disposed above the time card slot with the slot positioned at a lower end portion of the time stamp. Accordingly, the time card slot can be located lower than that in a case where the time card slot extends horizontally. This makes it possible to design the time stamp compact.

BRIEF DESCRIPTION OF THE DRAWINGS

These objects and other objects and advantages of the present invention will become more apparent upon reading of the following detailed description and the accompanying drawings in which:

FIG. **1** is a side view of a time stamp according to an embodiment of the present invention;

FIG. **2** is a side view of the time stamp with a time card inserted therein;

FIG. **3** is an enlarged view of the lower portion of the casing of the time stamp; and

FIG. **4** is a side view showing the time stamp attached to a wall surface.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A time stamp **11** according to one embodiment of the present invention will be described below with reference to the accompanying drawings.

As shown in FIG. **1**, the time stamp **11** has a print head **12** and a print head carriage mechanism **13** including a motor, accommodated in its casing, with a time card slot **14** formed below the print head **12** and the print head carriage mechanism **13**.

The time stamp **11** has a base **18** to be mounted on a substantially horizontal mount surface **21**.

The time card slot **14** is provided in such a way that a time card **15** is inserted therein from the front side of the time stamp **11** (left side in FIGS. **1** and **2**). The time card **15** inserted into the time card slot **14** is detected by a microswitch **16**. According to the result of the detection by the microswitch **16**, the print head carriage mechanism **13** adjusts the position of the print head **12**, which in turn prints time information or the like on the time card **15**.

The time card slot **14** is inclined downwardly in the depthwise direction of the time stamp **11** or toward a rear surface **11***a* of the time stamp **11** (rightward in FIGS. **1** and **2**).

Specifically, as shown in FIG. **3**, the time card slot **14** has an insertion opening **14***a* provided in such a way that a distance D**1** from the mount surface **21** becomes about 33 mm, and is formed to be inclined from the position of the insertion opening **14***a* in the depthwise direction of the time stamp **11** (in the direction of inserting a time card) at an angle θ of about 8 degrees.

With the time card **15** inserted into the time card slot **14**, its end portion **15***a* located on the insertion opening **14***a* side protrudes from the insertion opening **14***a* of the time card slot **14** by 10 cm or so.

Holding the end portion **15***a*, a user inserts or withdraws the time card **15**. As the time card slot **14** is formed to be inclined in the manner mentioned above, fingers holding the end portion **15***a* are separate from the mount surface **21** by a distance D**2** of about 47 mm. This makes it easier to insert or withdraw the time card **15** into or from the time card slot **14**.

A mount portion **17** is formed at the rear surface **11***a* of the time stamp **11**. The mount portion **17** is comprised of a hook or the like, and is structured in such a way that the time stamp **11** can be attached to a vertical wall surface as shown in FIG. **4**.

If the rear surface **11***a* of the time stamp **11** is formed perpendicular to a bottom surface **11***b* of the time stamp **11** (specifically, the bottom surface of the base **18**), when the time stamp **11** is attached to the vertical wall surface, the insertion opening **14***a* of the time card slot **14** rises upward, it becomes difficult to insert the time card **15** into the time card slot **14** depending on the attaching position of the time stamp **11**. The attaching position of the time stamp **11** is therefore limited.

According to the embodiment, therefore, the structure of the time stamp **11** is designed in such a way that when the time stamp **11** is attached to a vertical wall surface, the time card **15** can be inserted easily.

The rear surface **11***a* (surface which abuts on a wall surface) of the time stamp **11** is inclined by about 8 degrees with respect to the bottom surface **11***b* of the time stamp **11**, and is formed substantially perpendicular to the time card slot **14**. When the time stamp **11** is attached to a vertical wall surface as shown in FIG. **4**, therefore, the rear surface **11***a* extends along the wall surface, so that the time card slot **14** extends horizontally. This increases the degree of freedom of the attaching position of the time stamp **11** as compared with the aforementioned case where the insertion opening **14***a* of the time card slot **14** rises upward.

The time stamp **11** may be attached to a wall surface by means of a magnet or an adhesive as well as a hook.

According to the structure, as the time card slot **14** is formed to be inclined downwardly in the depthwise with the mount surface **21** of the time stamp **11** being a reference, the insertion opening **14***a* of the time card slot **14** easily comes into the view field of the user. Accordingly, the user can easily recognize the insertion opening **14***a*.

As the time card slot **14** is formed to be inclined downwardly in the depthwise direction, the time card **15**, when inserted into the time card slot **14**, inclines downward in the depthwise direction of the time card slot **14**. That is, the time card **15** is inclined in such a way that its end portion **15***a* located on the insertion opening **14***a* side of the time card slot **14** is positioned above an end portion **15***b* located on the depthwise side of the time card slot **14**. The mount surface **21** of the time stamp **11** is therefore separated from fingers holding the time card **15** by the angle of the inclination, thus facilitating the handling of the time card **15** and making it easier to insert the time card **15**. At the time of inserting the time card **15** into the time card slot **14**, especially, the end portion **15***a* of the time card **15** located on the insertion opening **14***a* side of the time card slot **14** is separate from the mount surface **21**, so that a sufficient clearance can be secured between the fingers holding the time card **15** and the mount surface **21**, thus making it easier to insert the time card **15**.

Because the time card slot **14** is formed to be inclined downwardly in the depthwise direction, the print head **12** and the print head carriage mechanism **13** can be disposed above the time card slot **14** with the slot **14** positioned at the lower end portion of the time stamp **11**. Accordingly, the time card slot **14** can be located lower than that in a case where the time card slot **14** extends horizontally. Therefore, the time stamp can be made compact.

The inclination angle θ of the time card slot **14** is set to 8 degrees in the foregoing embodiment, which is not restrictive. If the inclination angle θ is too small, fingers holding the time card **15** may unfavorably contact the mount surface **21**. If the inclination angle θ is too large, on the other hand, it is difficult to insert the time card **15** and the time stamp **11** becomes large. If the inclination angle θ is too large, the load applied in the case of moving the print head **12** in the lifting direction becomes larger. This demands a larger motor power accordingly, which leads to enlargement of the motor size. This results in enlargement of the time stamp **11**. In this respect, it is desirable to set the inclination angle θ of the time card slot **14** equal to 5 degrees or greater and 30 degrees or less with respect to the bottom surface **11***b* (or the mount surface **21**) of the time stamp **11**. It is more preferable that the time card slot **14** should be set equal to 8 degrees or greater and 10 degrees or less with respect to the bottom surface **11***b* (or the mount surface **21**) of the time stamp **11**. In this case, it is desirable that the rear surface **11***a* of the time stamp **11** should be formed to be inclined at an angle corresponding to the inclination angle θ in such a way the time card slot **14** becomes substantially horizontal when the rear surface **11***a* of the time stamp **11** (surface abutting on a wall surface when the time stamp **11** is attached to the wall surface) is attached to the wall surface.

From the viewpoint of handling the time card **15**, it is desirable to set the distance D**2** between the leading end of the time card **15** and the mount surface **21** to 35 mm or greater, preferably, to 45 mm or greater.

The invention is not limited to the foregoing embodiment, and can be modified and applied in various forms.

For example, although the time card slot **14** is provided in such a way that the time card **15** is inserted therein from the front side (left side in FIG. **2**) of the time stamp **11** in the embodiment, the time card slot **14** may be structured in such a way that the time card **15** is inserted therein leftward from the right side surface of the time stamp **11** or rightward from the left side surface of the time stamp **11**.

The means or the like of installing the time stamp **11** is optional, and a plurality of independent legs may be provided instead of the base **18**, or a hole may be provided in place of the mount portion **17**, so that a hook provided on a wall surface is engaged with the hole.

The insertion of the time card **15** may be recognized by an optical sensor or the like instead of the microswitch **16**.

The structures of the print head **12** and the print head carriage mechanism **13** are optional.

Various embodiments and changes may be made thereunto without departing from the broad spirit and scope of the invention. The above-described embodiment is intended to illustrate the present invention, not to limit the scope of the present invention. The scope of the present invention is shown by the attached claims rather than the embodiment. Various modifications made within the meaning of an equivalent of the claims of the invention and within the claims are to be regarded to be in the scope of the present invention.

This application is based on Japanese Patent Application No. 2008-261567 filed on Oct. 8, 2008 and including specification, claims, drawings and summary. The disclosure of the above Japanese Patent Application is incorporated herein by reference in its entirety.

What is claimed is:

1. A time stamp for printing time information on a time card, comprising:

a time card slot configured to receive the time card;

a mount portion attachable to a wall surface, the mount portion being provided at a rear surface of the time stamp;

a bottom surface of the time stamp, the bottom surface being settable on a mount surface;

a print head configured to print on the time card, the print head being disposed above the time card slot relative to the bottom surface; and

a print head carriage mechanism which adjusts a position of the print head, the print head carriage mechanism also being disposed above the time card slot, wherein

the time card slot is formed to be inclined downwardly in a depthwise direction at an angle of 8 degrees or greater and 10 degrees or less with respect to the bottom surface of the time stamp, the time card slot extending in a direction perpendicular to the rear surface of the time stamp.

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